

METHOD AND SYSTEM FOR SHORTENING CHANNEL IMPULSE RESPONSE  
USING TIME DOMAIN EQUALIZATION FILTER

**ABSTRACT**

A TEQ filter is provided for applications with asymmetric transmit and receive rates, such as for use in, for example, ADSL and VDSL applications. In particular, the present invention provides for a physical layer solution in which a channel impulse response is shortened by modeling a desired target impulse response based on a hypothetical delay channel. The target channel length is approximately matched to yield a set of TEQ filter coefficients or family of parameters. The TEQ filter coefficients or parameters when applied to the given channel impulse response yields a shortened channel impulse response to improve efficiency of data flow. Channel effects, receiver effects and other noise or disturbance effects are considered in modeling the system to derive the TEQ filter coefficients to generate the desired shortened channel impulse response. A minimum mean square error linearly constrained fast algorithm may be used for adaptive training of the Time Domain Equalizer (MLC-TEQ) and may be used to obtain Finite Impulse Response (FIR) filter coefficients for Time domain Equalizer (TEQ) used in Discrete Multitone (DMT) based applications.